Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of determining the structural health of a body; the method comprising the steps of identifying at least one phase characteristic of a signal represented by first data, the first data being derived from the body while bearing

(a) at least a guided wave, produced in response to application of at least a first excitation signal to the body, and

(b) a second excitation signal,

and providing a measure of the structural health of the body using the at least one phase characteristic.

2. (Previously Presented) A method as claimed in claim 1, in which the step of identifying at least one phase characteristic comprises the step of calculating a phase modulation of the first data using $\phi(t) = \arctan\frac{\hat{x}(t)}{x(t)}$, where $\hat{x}(t)$ is the Hilbert transform of the signal represented by the first data and x(t) is the signal represented by the first data.

3. (Previously Presented) A method as claimed in claim 2, in which the step of providing the measure of structural health comprises the step of determining an amplitude of the phase modulation.

4. (Previously Presented) A method as claimed in claim 3, in which the step of determining the amplitude of the phase modulation comprises the step of determining the maximum amplitude of the phase modulation.

5. (Previously Presented) Amethod as claimed in claim 1, in which the step of identifying at least one phase characteristic comprises the step of taking the Fourier transform of the first data and applying the convolution theorem which gives

$$F[\hat{x}(t)] = \hat{X}(f) = X(f)\{-j\,\mathrm{sgn}(f)\},$$

where sgn(f) is the signum function defined as

$$\mathrm{sgn}(f) = \begin{cases} 1 & for \quad f \geq 0 \\ -1 & for \quad f < 0 \end{cases},$$ where f is frequency.

6. (Previously Presented) A method as claimed in claim 1, in which the step of identifying comprises the step of comparing the first data with second data, representing the excitation signal launched into the body to produce a guided wave within the body, to identify a phase difference between the first and second data; and in which the at least one phase characteristic comprises the phase difference.

7. (Previously Presented) A method as claimed in claim 1, in which the step of identifying comprises the step of comparing the first data with second data, representing a previously determined response of the body to bearing a guided wave produced in response to the excitation signal being launched into the body, to identify a phase difference between the first and second data; and in which the at least one phase characteristic comprises the phase difference.

8. (Previously Presented) A method as claimed in claim 6, in which the phase difference is calculated using a cross-correlation function

$$R(\tau_i) = \sum_{t=1}^{N} x_{ref}(t)x(t+\tau),$$

where $R(\tau_i)$ is the cross-correlation function between the first and second data and N is the number of data samples of the first and second data.

9. (Previously Presented) A method as claimed in claim 8, in which the measure of structural health is given by at least one of $D=1-R(\tau_i)$ or $D=1/R(\tau_i)$.

10. (Previously Presented) A method as claimed in claim 6, in which the step of providing comprises the step of identifying the magnitude of the instantaneous phase difference between the first and second data.

11. (Previously Presented) A method as claimed in claim 1, in which the guided wave is a Lamb wave.

12. (Currently Amended) A method as claimed in claim 1, further comprising the steps of attaching a first transducer to the body and applying the first excitation signal to the [[first]] transducer to induce the propagation of the guided wave within the body.

13. (Previously Presented) A method as claimed in claim 12, further comprising the step of attaching a second transducer to the body and measuring the response of the second transducer to the presence of the guided wave.

14. (Currently Amended) A method as claimed in claim [[13]] 1, further comprising the steps of applying a third transducer to the body and applying the second excitation signal to the third transducer.

15. (Previously Presented) A method as claimed in claim 1, in which at least one excitation signal applied to a transducer is arranged to produce a guided wave having a predetermined frequency.

16. (Previously Presented) A method as claimed in claim 15, in which the predetermined frequency is selected according to the dimensions of an anticipated defect within the body.

17. (Previously Presented) A method as claimed in claim 1, in which at least one excitation signal is arranged to have at least one predetermined frequency component.

18. (Previously Presented) A method as claimed in claim 17, in which the at least one predetermined frequency component comprises at least one frequency component that is related to at least one of a desired mode of propagation of the guided wave and the thickness of the material under test, preferably, the at least one predetermined frequency component comprises at least one frequency component in the range 80 KHz to 10 MHz.

19. (Previously Presented) A method as claimed in claim 17, in which the at least one predetermined frequency component comprises at least one frequency component in the range 1 Hz to 10 KHz.

20. (Previously Presented) A method as claimed in claim 1, in which at least one excitation frequency is selected to induce a predetermined mode of propagation of the guided wave within the body.

21. (Previously Presented) A method as claimed in claim 12, in which a predetermined frequency of the excitation signal is selected according to a resonant mode of the first transducer.

22. (Previously Presented) A method as claimed in claim 3, in which the step of providing the measure of structural health comprises the step of comparing the amplitude of the phase modulation with an amplitude of at least one excitation signal.

23. Cancelled.

24. (Currently Amended) An apparatus for determining the structural health of a body, the apparatus comprising means for identifying at least one phase characteristic of a signal represented by first data, the first data being derived from the body while bearing

(a) at least a guided wave, produced in response to application of at least a first [[one]] excitation signal to the body, and

(b) a second excitation signal,

and means for providing a measure of the structural health of the body using the at least one phase characteristic.

25. (Previously Presented) An apparatus as claimed in claim 24, in which the means for identifying the phase characteristic comprises means for calculating a phase modulation of the first data using $\phi(t) = \arctan\frac{\hat{x}(t)}{x(t)}$, where $\hat{x}(t)$ is the Hilbert transform of the signal represented by the first data and x(t) is the signal represented by the first data.

26. (Previously Presented) An apparatus as claimed in claim 25, in which the means for providing the measure of structural health comprises means for determining the amplitude of the phase modulation.

27. (Previously Presented) An apparatus as claimed in claim 26, in which the means for determining the amplitude of the phase modulation comprises means for determining the maximum amplitude of the phase modulation.

28. (Previously Presented) An apparatus as claimed in claim 24, in which the means for identifying comprises means for taking the Fourier transform of the first data and means for applying the convolution theorem which gives

$$F[\hat{x}(t)] = \hat{X}(f) = X(f)\{-j\,\mathrm{sgn}(f)\},$$

where sgn(f) is the signum function defined as

$$\mathrm{sgn}(f) = \begin{cases} 1 & \text{for} \quad f \geq 0 \\ -1 & \text{for} \quad f < 0 \end{cases},$$ where f is frequency.

29. (Previously Presented) An apparatus as claimed in claim 24, in which the means for identifying comprises means for comparing the first data with second data, representing at least one excitation signal launched into the body to produce a guided wave within the body, to identify a phase difference between the first and second data; and in which the at least one phase characteristic comprises the phase difference.

30. (Previously Presented) An apparatus as claimed in claim 24, in which the means for identifying comprises means for comparing the first data with second data, representing a previously determined response of the body to bearing a guided wave produced in response to the excitation signal launched being launched into the body, to identify a phase difference between the first and second data; and in which the at least one phase characteristic comprises the phase difference.

31. (Previously Presented) An apparatus as claimed in claim 29, in which the phase difference is calculated using a cross-correlation function

$$R(\tau) = \sum_{t=1}^{N} x_{ref}(t)x(t+\tau),$$

where $R(\tau_i)$ is the cross-correlation function between the first and second data and N is the number of data samples of the first and second data.

32. (Previously Presented) An apparatus as claimed in claim 31, in which the measure of structural health is given by at least one of $D=1-R(\tau_i)$ or $D=1/R(\tau_i)$.

33. (Previously Presented) An apparatus as claimed in claim 29, in which the means for providing a measure of the structural health of the body comprises means for identifying the magnitude of the instantaneous phase difference between the first and second data.

34. (Currently Amended) An apparatus as claimed in claim 24, ~~in which the guided wave is a Lamb wave~~ further comprising means for attaching a first transducer to the body and means for applying the first excitation signal to the first transducer to induce the propagation of the guided wave within the body.

35. (Previously Presented) An apparatus as claimed in claim 24, further comprising means for attaching a first transducer to the body and means for applying the excitation signal to the first transducer to induce the propagation of the guided wave within the body.

36. (Previously Presented) An apparatus as claimed in claim 35, further comprising means for attaching a second transducer to the body and means for measuring the response of the second transducer to the presence of the guided wave.

37. (Currently Amended) An apparatus as claimed in claim 36, further comprising means for applying a third transducer to the body and means for applying [[a]] <u>the</u> second excitation signal to the third transducer.

38. (Previously Presented) An apparatus as claimed in claim 35, in which at least one excitation signal applied to the transducer is arranged to produce a guided wave having a predetermined frequency.

40. (Previously Presented) An apparatus as claimed in claim 24, in which at least one excitation signal is arranged to have at least one predetermined frequency component.

41. (Previously Presented) An apparatus as claimed in claim 40, in which the at least one predetermined frequency component comprises at least one frequency component that is related to at least one of desired mode of propagation of the guided wave and the thickness of the material under test and preferably comprises at least one frequency component in the range of 80 KHz to 10 MHz.

42. (Previously Presented) An apparatus as claimed in claim 40, in which the at least one predetermined frequency component comprises at least one frequency component in the range of 1 Hz to 10 KHz.

43. (Previously Presented) An apparatus as claimed in claim 24, in which at least one excitation signal has frequency selected to induce a predetermined mode of propagation of the guided wave within the body.

44. (Previously Presented) An apparatus as claimed in claim 35, in which at least one excitation signal has a predetermined frequency selected according to a resonant mode of the first transducer.

45. (Previously Presented) An apparatus as claimed in claim 24, in which the means for providing the measure of structural health comprises means for comparing the amplitude of the phase modulation with the amplitude of the excitation signal.

47. (Currently Amended) A computer program product, residing on a computer readable medium for determining the structural health of a body, identifying at least one phase characteristic of a signal represented by first data, the first data having been derived from the body while bearing

(a) at least a guided wave produced in response to application of at least [[one]] a first excitation signal to the body; and

(b) a second excitation;

and providing a measure of the structural health of the body using the at least one phase characteristic".